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SOFTWARE ARCHITECTURE OF INFORMATION SYSTEM FOR EXCHANGING THEMATIC PROMPTS FOR LLM

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In today's rapidly evolving landscape of large-scale language models, the ability to exchange, curate, and refine thematic prompts has become an essential component of effective natural language processing workflows. As organizations across industry, academia, and the open-source community increasingly rely on LLMs to generate domain-specific content, conduct data analysis, and power conversational agents, the management of prompt repositories emerges as a critical challenge [1, 2]. Without a dedicated information system to catalog, version, and share prompts according to their thematic contexts – such as customer support, legal drafting, or scientific summarization – teams face duplicated effort, inconsistent outputs, and difficulties in reproducing experimental results [3].

With the development of Large Language Models (LLM) architectures and their increasingly widespread implementation in various application environments, there is an urgent need for systematic exchange and sharing of topic prompts [4]. The emergence of advanced generative models with billions of parameters has opened up the possibility of automated creation of high-quality texts, translation, summarization of scientific articles, code generation and solving numerous other natural language processing tasks [5, 6]. However, the effectiveness of LLM application directly depends on the quality of the initial instructions – prompts that set the context and stylistic guidelines for generation. Therefore, a key question arises: how to accumulate, structure and exchange the most relevant and proven prompts so that users do not waste time on multiple testing and refinement of queries [7].

The relevance of research in the field of topic prompt exchange is due not only to the need to increase the productivity of individual specialists and business teams, but also to the requirements of reproducibility of scientific results and transparency of experimental settings. In scientific projects and R&D departments of corporations, one often faces the problem of "prompt-chasing": a large number of trials and errors to achieve the desired initial content leads to significant overhead of resources and loss of integrity of replicated studies [8]. A centralized platform, where prompt topics are cataloged by domain, modified, evaluated by metrics of accuracy and generation speed, and also exchanged between teams, can radically change the approach to prompt engineering and optimize the overall workflow with LLM [9].

The prospects for using LLM in the near future go beyond simple text content: models demonstrate the ability to process structured data, conduct analytics from educational and scientific corpora, even understand the meaning of the code and automatically create software modules [10]. At the same time, the exchange of prompts becomes a tool of collective intelligence: specialists from different industries can share optimal instructions for specific tasks, from financial analysis to medical diagnostics. Such cooperation will contribute to the faster dissemination of best practices, reduce duplication of efforts and accelerate the implementation of LLM solutions in applied industries.

In addition, the exchange of thematic prompts can become a key element in building an ecosystem of open scientific data and model repositories. Standardized prompt description formats, their versioning and documentation will allow creating transparent algorithmic chains, where each scientific or production result is accompanied by an accurate set of initial settings. This brings the field of machine learning closer to the level of rigor of physical or chemical research, where reproducibility and hypothesis testing are an integral part of the scientific method.

Consider, for instance, an image-to-image translation network aimed at converting daytime aerial photography into realistic nighttime simulations [11]. A thematic prompt such as "urban center with neon signage and vehicle light trails" can instruct the transformer to prioritize attention on built-up areas and moving objects, yielding more coherent and semantically faithful results than unguided fine-tuning. Likewise, in medical imaging, prompts like "arterial structures in contrast-enhanced MRI" can steer the model's feature detectors to vascular patterns, enhancing sensitivity

to subtle anomalies while suppressing background noise [12, 13]. In each case, the prompt operates as a soft constraint injected into the transformer's token embeddings or positional encodings, serving as a cognitive scaffold that bridges generic pretraining and task-specific inference [14].

By defining a clear software architecture for a prompt-exchange platform, researchers and practitioners can address these pain points through modular components that handle prompt ingestion, metadata annotation, access control, and execution tracking. A well-engineered system not only streamlines collaboration among distributed teams but also incorporates capabilities for tagging prompts by performance metrics, automating compatibility checks against evolving model APIs, and ensuring compliance with organizational security policies. As LLM ecosystems continue to diversify – with models differing in tokenization schemes, attention mechanisms, and fine-tuning interfaces – the architectural design of an information system must anticipate extensibility, scalability, and interoperability, enabling seamless integration of new model backends and user-defined prompt transformations.

Moreover, such an architecture underpins advanced features like template inheritance, context-aware prompt recommendation, and federated prompt sharing across organizational boundaries, thereby accelerating innovation while safeguarding intellectual property. In sum, the software architecture of an information system for exchanging LLM thematic prompts constitutes a foundational enabler for reproducible research, efficient prompt engineering, and the democratization of language-model capabilities in both enterprise and research settings.

The purpose of the work is designing of software architecture of information system for exchanging thematic prompts for large language models.

The functional structure of software architecture of information system for exchanging thematic prompts for large language models defines the main modules of the system and the relationships between them, which ensure the execution of all planned user scenarios and administrative tasks. The information system for exchanging thematic prompts is developed according to the architectural pattern MVC (Model-View-Controller), which is a standard for the Laravel framework. This approach provides a clear division of responsibility between components: the Model is responsible for working with data and business logic, the View is responsible for presenting data to the user, and the Controller is responsible for processing user requests and interaction between the Model and the View.

The main functional blocks of software architecture of information system for exchanging thematic prompts for large language models can be presented as follows:

Authentication and authorization module:

User registration: Enabling new users to create accounts using email and password.

User authentication: Verifying user credentials for logging in. Implementing the "Remember me" function and password recovery.

Two-factor authentication (2FA): Increase the security of accounts by requiring a second factor of verification (for example, a code from a mobile application).

Social authentication (OAuth): Provide the ability to log in using Google and Facebook accounts.

User profile management: The ability for users to edit their personal data, change their password, configure security settings.

Role and permission system: Delimit access to platform functionality based on assigned roles (for example, “Guest”, “Registered user”, “Subscriber (Creator)”, “Administrator”). Administrators have the ability to manage the roles and permissions of other users.

Prompt management module:

Create and edit prompts: Functionality for users with appropriate rights (for example, the “Creator” role) to add new prompts and edit existing ones. The prompt creation form includes fields for the title, description, prompt body text, target VMM selection, category, adding keywords, and preview image.

Prompt catalog: Displays a list of available prompts with the ability to sort and pagination.

Prompt search and filtering: Advanced prompt search capabilities by keywords, title, author, as well as filtering by categories, VMM models, and rating.

Prompt detailed view page: Displays full information about the prompt, including its text (with the ability to copy), author, publication date, rating, and comments.

Rating and comment system: Allows registered users to rate prompts and leave comments, contributing to community formation and feedback.

VMM category and model management: Administrative functionality for creating, editing, and deleting prompt categories and a list of supported large language models.

Subscription and Payment Management Module:

Subscription Plans: Define different subscription levels (e.g. “Basic”, “Creator”) with different sets of available features and limits.

Stripe Integration: Ensure secure processing of subscription payments through the Stripe payment system.

User Subscription Management: Enable users to view their current subscription plan, payment history and manage their subscription (change plan, cancel).

Admin Plan Management: Enable administrators to create, edit and activate/deactivate subscription plans.

Admin Module:

Dashboard: A general dashboard with key platform performance indicators.

User Management: View the list of users, edit their data, assign roles, lock/unlock accounts.

Content Management: Moderation of prompts and comments, management of categories, tags and other taxonomies.

Site Settings Management: Configuration of basic platform parameters, such as site name, contact information, integrations with external services.

View logs and statistics: Tools for monitoring site activity and analyzing data.

In closing, the design of a robust software architecture for an information system dedicated to the exchange of thematic prompts for large language models represents a

critical advancement in the maturing field of prompt engineering. By adhering to the proven MVC paradigm and leveraging a modular decomposition of responsibilities, the proposed system not only ensures maintainability and scalability but also fosters a collaborative environment in which users can seamlessly share, refine, and repurpose high-quality prompts. The authentication and authorization layer safeguards intellectual property and enforces role-based access, while the prompt management core abstracts the complexities of prompt versioning, metadata curation, and performance tracking behind intuitive interfaces. Integration of subscription and payment workflows further underscores the platform's readiness for real-world deployment, providing a clear pathway to sustainability without compromising the open exchange of knowledge.

Moreover, embedding administrative dashboards and analytics tools within the same architectural framework empowers platform stewards with real-time visibility into usage patterns, prompt efficacy, and system health. This holistic perspective is crucial for iterative refinement: as new model backends emerge and user requirements evolve, the system's loosely coupled modules can be independently extended or replaced, thus accommodating emerging paradigms such as federated prompt sharing or AI-driven prompt recommendation. Ultimately, this architectural blueprint lays the groundwork for a vibrant ecosystem in which prompt creators, consumers, and maintainers converge to accelerate model fine-tuning, enable reproducible research, and democratize access to cutting-edge language technologies. The information system, in its current form, therefore stands not only as a practical tool for today's practitioners but also as a flexible foundation for the innovations that will shape the next generation of natural language interfaces.

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DEVELOPMENT OF A SOFTWARE PACKAGE FOR INTELLIGENT MONITORING OF CUSTOMER FLOW IN COFFEE SHOPS

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Monitoring the customer flow in coffee shops is an important element of successful management of the establishment and increasing its competitiveness. For the effective functioning of coffee shops, it is necessary to ensure continuous collection and analysis of order data, which allows you to determine the dynamics of attendance and the popularity of individual menu items.

The software system allows you to conveniently process order data, taking into account seasonal fluctuations, peak hours, and other factors. Monitoring systems help optimize staff performance, plan inventory, and improve customer service. Thanks to the fast and accurate collection of data on customer activity, such solutions increase the level of service and help improve the business performance of the coffee shop.

The development of a software system for monitoring the flow of customers allows users to access analytical data without the need to install special software.

The object of research is the processes of creating a software system for monitoring customer flow in coffee shops.

The subject of the study is the methods and means of implementing a software system for collecting and processing data on customer orders.

The main task is to develop a software package that will allow you to track the dynamics of attendance and maintain effective management of service processes in coffee shops.

Development of a software package for intelligent monitoring of customer flow in coffee shops

When developing the requirements for the system and its functionality, we analyzed analogues. The following systems were selected for analysis: RetailNext, PosterPOS, and PayKit.

RetailNext [1] - It is a modern platform developed by RetailNext that allows not only monitoring the flow of customers but also integrating financial operations, warehouse management, reporting, and analytical data visualization. The system can